

## CURRICULUM VITAE

**Name:** Gregory A. Petsko  
**Position:** Professor of Neurology, Ann Romney Center for Neurologic Diseases,  
Harvard Medical School and Brigham & Women's Hospital

Home Addresses: 17 Commonwealth Ave., Unit 1, Boston, MA 02116; One Old Colby Way,  
Manchester-by-the-Sea, MA 01944; and 308 East 72<sup>nd</sup> St., Unit 10A, New York, NY  
10021

Date of Birth: August 7, 1948

Place of Birth: Washington, D.C., USA

Marital Status: Married to Laurie H. Glimcher, MD, President and CEO, Dana Farber Cancer  
Research Institute, and Richard and Susan Smith Professor of Medicine, Harvard  
Medical School, Boston, MA

### **Education:**

1970 B.A. Princeton University, Princeton, NJ (*Summa Cum Laude* - Chemistry)  
1973 D.Phil. Oxford University, Oxford, England (Rhodes Scholar)  
Molecular Biophysics (Thesis Advisor: Prof. Sir David C. Phillips, FRS)

### **Postdoctoral Training:**

1973 EMBO Fellowship with Prof. Pierre Douzou, Institut de Biologie Physico-  
Chimique,  
Universite de Paris, Paris, France

### **Academic Appointments (current active appointments in bold):**

**2020 - Professor of Neurology, Ann Romney Center for Neurologic Diseases,  
Harvard Medical School and Brigham & Women's Hospital**

**2019 - Adjunct Professor of Neuroscience, Weill Cornell Medical College**

**2012 - Adjunct Professor of Biomedical Engineering, Cornell University**

2012 - 2018 Arthur J. Mahon Professor of Neurology and Neuroscience, Weill Cornell  
Medical College

2014 - 2018 Director, Helen and Robert Appel Alzheimer's Disease Research Institute  
Weill Cornell Medical College

2008 - 2011 Chair, Department of Biochemistry, Brandeis University

2007- Associate Member, Tufts-New England Medical Center Cancer Center

2010 - Honorary Member, European Res. Institute for Integrated Cellular Pathology

1996 - 2012 Gyula and Katica Tauber Professor of Biochemistry and Chemistry, Brandeis  
University (now Emeritus)

1994 - 2007 Director, Rosenstiel Basic Medical Sciences Research Center, Brandeis  
University

1990 - 1993 Lucille P. Markey Professor, Department of Biochemistry and Department of  
Chemistry, Brandeis University

1985 - 1990 Professor, Department of Chemistry, Massachusetts Institute of Technology

1979 - 1984 Associate Professor, Department of Chemistry, Massachusetts Institute of  
Technology

1976 – 1979 Assistant Professor, Department of Biochemistry, Wayne State Univ. Med. Sch  
 1974 – 1976 Instructor, Department of Biochemistry, Wayne State Univ. Med. School

**Awards and Honors:**

1969 Sigma Xi  
 1970 Phi Beta Kappa  
 1970 Chemical & Engineering News National Merit Award  
 1970 American Institute of Chemists Student Award  
 1970 Sigma Xi Student Award  
**1970-1973 Rhodes Scholarship to Oxford University**  
 1970 Fullbright Fellowship (declined)  
 1970 Danforth Foundation Fellowship (declined)  
 1973 European Molecular Biology Organization Fellowship to the Institut de Biologie Physico-Chimique (Paris)  
 1974-1975 Wayne State University Faculty Research Award  
 1978-1983 U.S. Public Health Service Research Career Development Award  
 1978-1982 Alfred P. Sloan Foundation Fellowship  
 1980 Siddhu Award for outstanding contributions to X-ray diffraction, American Crystallographic Association  
**1986 Pfizer Award in Enzyme Chemistry - American Chemical Society**  
 1987 Co-Chairman, Gordon Conference on Enzymes  
 1989 Alexander von Humboldt Senior Scientist Award  
**1991 Max Planck Prize (shared with Professor Roger Goody)**  
 1995 **Elected to the National Academy of Sciences - later, with David Eisenberg, co-founded Section 29 of the Academy**  
 1996 Guggenheim Foundation Fellowship  
**1997 Honorary Fellow, Biochemical Society of Japan**  
 2001 Lynen Medal (shared with Professor Janet Thornton)  
 2001 **Elected to the National Academy of Medicine**  
 2002 **Elected to the American Academy of Arts and Sciences**  
**2003 Elected Fellow, American Association for the Advancement of Science**  
 2003 Duvoisin Fellowship, American Parkinson Disease Association  
 2004 McKnight Endowment for Neuroscience Brain Disorders Award (shared with Prof. Dagmar Ringe)  
 2005 Abram Sacchar Award (shared with Prof. Dagmar Ringe)  
 2008-2010 Elected President, American Society for Biochemistry and Molecular Biology  
 2009 Alexander Rich Medal  
 2010 **Elected a Foreign Member, Hungarian Academy of Sciences**  
 2010 Honorary Member, European Res. Institute of Integrated Cellular Pathology  
 2010 **Elected to the American Philosophical Society**  
**2011 Honorary Doctor of Laws, Dalhousie University, Halifax, Nova Scotia, Canada**  
 2012-2015 Elected President, International Union of Biochemistry and Molecular Biology  
 2013 The Perry Award for excellence in research, education, and public policy  
 2014-2015 Phi Beta Kappa Visiting Scholar  
 2014 Named one of the 30 most influential people in the world in public health:  
<http://www.masterspublichealth.net/30-most-influential-people-in-public-health/>  
 2015 Martin J. Buerger Award of the American Crystallographic Association  
 2015 Debye Lectures, Cornell University  
**2015 Fellow, American Neurological Association**

2016-2017 Elected President, The Harvey Society  
 2016-2017 Elected Chair of the Medical Sciences Section of the American  
 Association for the Advancement of Science  
 2020 Honorary Master of Arts, Harvard University, Cambridge, Massachusetts, USA

**2023**      **Awarded The National Medal of Science by President Joe Biden**  
**(Established in 1963 by President John F. Kennedy, the NMoS is the**  
**highest honor the United States can confer on a scientist or engineer.)**  
**2025**      **Elected a Fellow of the American Society for Biochemistry and Molecular**  
**Biology**

#### **Major National and Local Committee Assignments:**

National:      Member, Council of Scientific Society Presidents, 2008 -  
 Chair, NAS/NAM/NAE Committee on the Postdoctoral Experience, 2012-2015  
 Member, Biological and Environmental Research Advisory Committee, Department  
 of Energy, 2007-2013  
 Member, Board of Life Sciences, National Research Council, 2001-2008  
 Member, Board of Chemical Sciences, National Research Council, 1995-2001  
 Brandeis:      Member, Provost Search Committee 2001; Presidential Search Committee 2010

#### **Scientific Advisory Boards:**

Genetics Institute	1981-1989
Sterling-Winthrop, Inc.	1997-1999
Genome Therapeutics	1990-1999
ArQule, Inc.	1994-2001
New Chemical Entities	1997-2000
Tactix	1997-2003
MediQuest Therapeutics	1997- 2007
Microbia/Ironwood Phar.	1998- 2007
MannKind	2001- 2010
Compound Therapeutics	2003-2009
Link Medicines, Inc.	2005 -2009
Howard Hughes Med. Inst.	1994-2008
Pfizer, Inc.	2008-2011
Amicus Therapeutics	2005 –
Proclara Biosciences	2011 –
Meira GTx	2016 –
AnnovisBio	2017 –
Retromer Therapeutics	2020 –
Aevum Therapeutics	2023 –

**Governance Boards:**

2008	Medical Advisory Board, Howard Hughes Medical Institutes	2004-
2003	Board of Directors, The Dibner Institute, Cambridge, Mass.	1994-
2017	Board of Directors, New York Structural Biology Center, Inc.	2013-
	Board of Directors, ALS Therapy Alliance (Treasurer)	2012-2019
	Council of Scientific Society Presidents	2008-
	Board of Governors, New York Academy of Sciences	2013-

Board of Trustees, Brandeis University

2015-

**Editorial Boards:**

Protein Engineering (Founding Editor and Executive Editor)	1986-2003
Current Opinion in Structural Biology	1996-2004
Journal of Biochemical Education	2000-2010
Annual Reviews in Biochemistry	2000-2005
Current Protocols in Bioinformatics	2000-2010
Trends in Biochemical Sciences	2000-
PLoS Biology (one of the Founding Editors)	2001-
Proceedings of the National Academy of Sciences	2008 – 2018
<i>Science Advances</i> (Associate Editor)	2015 – 2019
Cell Stress (one of the Founding Editors)	2016 -

**Professional Societies (leadership positions in bold):**

American Academy of Neurology  
 American Neurological Association (Fellow)  
 American Crystallographic Association; **co-founder of Macromolecular Crystallography subsection**  
 American Association for the Advancement of Science (Fellow) (**Chair, Medical Sciences, 2016-2017**)  
 American Chemical Society  
 American Society for Biochemistry and Molecular Biology (**President, 2008-10**)  
 American Society for Microbiology  
 Biophysical Society  
 Genetics Society of America  
 American Academy of Arts and Sciences (Elected Member)  
 National Academy of Medicine (Elected Member)  
 National Academy of Sciences (Elected Member); **co-founder of Section 29 (Biophysics)**  
 American Philosophical Society (Elected Member)  
 Biochemical Society of Japan (Honorary Member)  
 Hungarian Academy of Sciences (Elected Foreign Member)

**Founding Member, Museum of the American Revolution, Philadelphia, PA**

**Major Research Interests:** Protein structure and function; enzyme catalysis; protein dynamics; yeast genetics; protein trafficking, neurodegenerative diseases, especially Alzheimer's and Parkinson's diseases, frontotemporal dementia, Multiple System Atrophy, and ALS (Lou Gehrig's disease).

**Teaching Experience:** Over 50 years experience teaching courses to undergraduates, graduate students, and medical students. I have taught Introductory Biochemistry, Kinetics, Statistical Thermodynamics, Mechanistic Enzymology, Protein Crystallography, Introductory Biophysics, Statistics, and Physical Chemistry. I have also taught laboratory courses in Biochemistry and General Chemistry. For over twenty years I taught Freshman Chemistry, the largest course at Brandeis (enrollment > 250). Since I started my college life as an humanities major (Classical Literature), I like to keep my hand in by teaching liberal arts courses from time to time; hence, every few years I teach either a course in The Social History of the Detective Story; The Treatment of Science and Scientists in the Cinema; or Critical Thinking. I have also taught courses in Chemistry and Art and Shakespeare.

**Research Setting:** Current supervision of five postdoctoral fellows and one research assistant.

**Companies Founded:** In addition to my academic career, I have helped found several biotechnology companies, including **ArQule, Inc.**, a combinatorial chemistry company acquired by Merck in 2018, and **New Chemical Entities**, a natural products company that was sold to Albany Molecular Research in 2001. I was a founding investor of **Ironwood Pharmaceuticals**, a public company (NASDAQ: IRWD) that develops drugs to treat, among other things, irritable bowel syndrome. I am also a co-founding scientist of **SPR Pharma, Inc.**, which became **Denali Therapeutics** (NASDAQ: DNLI), and a co-founder of **Retromer Therapeutics and Aevum Therapeutics** (both privately held).

**Patents:**

United States Patent # 9,116,157: ICE-Cleaved Alpha-Synuclein as a Biomarker  
United States Patent # 8,609,649: Compositions and methods for the diagnosis, treatment, and prevention of amyotrophic lateral sclerosis and related neurological diseases  
United States Patent #10,533,038: Methods of reducing TDP-43-mediated neuronal cytotoxicity in Amyotrophic Lateral Sclerosis by a UPF1 polypeptide or polynucleotide  
United States Patent #11,332,504: Methods of reducing FUS/TLS or TDP-43-mediated neuronal cytotoxicity by UPF1  
United States Patent #12,275,764: Methods of reducing FUS/TLS or TDP-43-mediated neuronal cytotoxicity in amyotrophic lateral sclerosis (ALS) by UPF1  
European Patent #3,657,168 B1: Treatment of Amyotrophic Lateral Sclerosis  
Hong Kong Patent #40,030,841 B: Treatment of Amyotrophic Lateral Sclerosis  
Five others filed; under consideration.

**Social Clubs:** United Oxford and Cambridge University Club, 71-77 Pall Mall, London SW1Y 5HD, UK  
The Cornell Club - New York, 6 E 44th St, New York, NY 10017  
The Harmonie Club, 4 E 60th St, New York, NY 10022  
The 'Quin House, 217 Commonwealth Avenue, Boston, MA 02116

**Research Funding - Ongoing funded projects that I would like to highlight include:**

**NIH/NIA (National Institute on Aging) 1RF1AG091846**

Petsko (PI)  
09/01/2024-08/31/2029  
SORL1-Retromer Structural Biology in the Pathogenesis of Alzheimer's Disease

**Alzheimer's Association and Rainwater Foundation (The Tau Pipeline Program)**

Petsko and Small (co-PIs)  
01/01/2023 – 12/31/2025  
Enhancing Retromer Function: A Novel Therapeutic Strategy for Tauopathies

**Aevum Therapeutics**

Petsko (PI)  
04/30/24 – 04/29/26  
Testing Irisin as a Potential Therapeutic for Progressive Supranuclear Palsy and Frontotemporal Dementia

**NIH/NIA (National Institute on Aging) 1P01AG090268**

Petsko and Small (Co-PIs)  
01/09/25-08/31/30  
SORL1 and its involvement in Alzheimer's disease pathogenesis and pathophysiology

**Bibliography**

(In addition to scientific publications, from 2000 through 2012 I wrote a monthly opinion column for the peer-reviewed journal *Genome Biology*. My columns are indexed on PubMed and many have been reprinted in other publications such as *Science* and *The Scientist*. A book of the first 10 years of columns has been published (see Books).)

### Books:

Gregory A. Petsko, and Dagmar Ringe, *Primers in Biology: Protein Structure and Function* New Science Press, Ltd. , London (2003) 195 pp.

**Gregory Petsko in Genome Biology: The first 10 years** (BioMed Central, London and New York; Kindle Edition - Oct 6, 2010) - Kindle eBook; also available in iBooks for iPads.

### Research Publications:

A full list of my publications may be obtained from:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/1HeDbpgv15yAr/bibliography/40647176/public/?sort=date&direction=ascending>

1. Petsko, G.A. "Proton Magnetic Resonance Spectrum of 'Anomalous' Water", **Science**, 167, 171-172 (1970).
2. Petsko, G.A. "Proton Magnetic Resonance Studies of 'Anomalous' Water-Water Mixtures", **J. Colloid and Interface Science**, 36, 503-508 (1971).
3. Russel Massey, W. Jr. and Petsko, G.A. "X-Ray Diffraction Investigations of 'Anomalous' Forms of Water", **J. Colloid and Interface Science**, 36, 508-512 (1971).
4. Banner, D.W., Bloomer, A.C., Petsko, G.A., Phillips, D.C., and Pogson, C.I. "Crystallographic Studies of Chicken Triose Phosphate Isomerase", **Cold Spring Harbour Symp. Quant. Biol.** XXXVI, 151-155 (1971).
5. Marsh, D.J. and Petsko, G.A. "A Low Temperature Device for Protein Crystallography", **J. Appl. Cryst.**, 6, 76-80 (1973).
6. Petsko, G.A. "X-Ray Crystallographic Studies of Enzyme-Substrate Interactions", **Proc. XVI Int. Table Ronde Roussel**, Paris, 9-19 (1973).
7. Banner, D.W., Bloomer, A.C., Petsko, G.A., Phillips, D.C., Pogson, C.I., and Wilson, I.A. "The Structure of Triose Phosphate Isomerase at 2.5Å Resolution", **Nature**, 225, 609-614 (1975).
8. Douzou, P., Hui Bon Hoa, G., and Petsko, G.A. "Protein Crystallography at Sub-zero Temperatures: I. Lysozyme-Substrate Complexes in Cooled Mixed Solvents", **J. Mol. Biol.**, 96, 367-380 (1975).
9. Petsko, G.A. "Protein Crystallography at Sub-zero Temperatures: II. Cryo-Protective Mother Liquors for Protein Crystals", **J. Mol. Biol.**, 96, 381-392 (1975).

10. Petsko, G.A. "A New Synthesis for the Refinement of Heavy-Atom Parameters in Protein Crystallography", **Acta. Cryst.**, A32, 473-476 (1976).
11. Petsko, G.A. and Tsernoglou, D. "The Structure of Subtilopeptidase A. I. X-ray Crystallographic Data", **J. Mol. Biol.**, 106, 453-456 (1976).
12. Martin, P.D., Petsko, G.A., and Tsernoglou, D. "New High pH Crystal Forms of Ribonuclease A and S", **J. Mol. Biol.**, 108, 265-269 (1976).
13. Banner, D.W., Bloomer, A.C., Petsko, G.A., Phillips, D.C., and Wilson, I.A. "Atomic Coordinates for Triose Phosphate Isomerase from Chicken Muscle", **Biochem. Biophys. Res. Comm.**, 72, 146-155 (1976).
14. Alber, T., Petsko, G.A., and Tsernoglou, D. "Crystal Structure of an Elastase-Substrate Complex at -55°C", **Nature**, 236, 297-300 (1976).
15. Tsernoglou, D. and Petsko, G.A. "The Crystal Structure of a Post-Synaptic Neurotoxin from Sea Snake at 2.2 Å Resolution", **FEBS Lett.**, 68, 1-4 (1976).
16. Tsernoglou, D. and Petsko, G.A. "The Three-Dimensional Structure of Neurotoxin A from Philippines Sea Snake Venom", **Proc. Nat. Acad. Sci. USA**, 7, 971-974 (1977).
17. Tsernoglou, D. and Petsko, G.A. "Protein Sequencing by Computer Graphics", **Biochim. Biophys. Acta**, 491, 605-608 (1977).
18. Tsernoglou, D. Petsko, G.A., and Walz, D.A. "Crystallization and X-ray Diffraction Studies of Bovine Thrombin", **Chemistry and Biology of Thrombin**, (R.L. Lundblat, J.W. Fenton II, and K.G. Mann, eds.) Ann Arbor Science Publishers, Inc., Ann Arbor, Michigan, 123-128 (1977).
19. Hermans, J. Jr., McQueen, J.E. Jr., Petsko, G.A., and Tsernoglou, D. "Molecular Graphics: Application to the Structure Determination of a Snake Venom Neurotoxin", **Science**, 197, 1378-1381 (1977).
20. Petsko, G.A., Phillips, D.C., and Williams, R.J.P. "The Protein Crystal Chemistry of K<sub>2</sub>PtCl<sub>4</sub>": general principles and interactions with triose phosphate isomerase." **J. Mol. Biol.**, 120, 345-358 (1978).
21. Tsernoglou, D., Petsko, G.A., and Hudson, R.A. "Structure and Function of Snake Venom Curarimimetic Neurotoxins", **Mol. Pharm.**, 14, 710-716 (1978).
22. Rose, D., Satio, M.I., Petkso, G.A., Tsernoglou, D., and Yonetani, T.Y. "The Structure of Oxy Cobalt Myoglobin at 1.5 Å Resolution", **Frontiers of Biological Energetics**, P.L. Dutton, J. Leigh and A. Scarpa, eds., Academic Press, Volume II, pp. 1011-1016 (1978).
23. Smith, W.W., Ludwig, M.L., Pattridge, K.A., Tsernoglou, D., and Petsko, G.A. "Crystallographic Studies of Flavodoxins: some Correlations Between Structure and Redox Potential", **Frontiers of Biological Energetics**, P.L. Dutton, J. Leigh and A. Scarpa, eds., Academic Press, Volume II, pp. 957-964 (1978).
24. Frauenfelder, H., Petsko, G.A., and Tsernoglou, D. "Temperature-Dependent X-Ray Diffraction as a Probe of Protein Structural Dynamics", **Nature**, 280, 558-563 (1979).

25. Frauenfelder, H. and Petsko, G.A. "Structural Dynamics of Liganded Myoglobin", **Biophys. J.**, 10, 465-483 (1980).
26. Douzou, P. and Petsko, G.A. "Les Proteines en Action", **La Recherche**, 11, 534-542 (1980).
27. Alber, T., Fahnestock, M., Mowbray, S., and Petsko, G.A. "Preliminary X-Ray Data for the Galactose Binding Protein from *Salmonella typhimurium*", **J. Mol. Biol.**, 147, 471-474 (1981).
28. Fink, A.L. and Petsko, G.A. "X-Ray Cryoenzymology", **Adv. Enzymol.**, Vol. 52, 177-246 (1981).
29. Alber, T., Hartman, F.C. Johnson, R.M., Petsko G.A., and Tsernoglou, D. "Crystallization of Yeast Triose Phosphate Isomerase from Polyethylene Glycol", **J. Biol. Chem.**, 256, 1356-1361 (1981).
30. Alber, T., Banner, D.W., Bloomer, A.C., Petsko, G.A., Phillips, D.C., Rivers, P.S., and Wilson, I.A. "Structure and Catalytic Mechanism of Triose Phosphate Isomerase", **Phil. Trans. Royal Society London**, B293, 159-171 (1981).
31. Yamakura, F., Suzuki, K., Petsko, G.A., and Tsernoglou, D. "Metal Replacement Studies and Crystallographic Data on Iron-Superoxide-Dismutase from *Pseudomonas Ovalis*", in **Chemical and Biophysical Aspects of Superoxide and Superoxide Dismutase**, J.V. Bannister and H.A.O. Hill, eds., Elsevier, Amsterdam, 1981, pp. 242-253.
32. Hartmann, H., Parak, F., Steigemann, W., Ringe Ponzi, D., Petsko, G.A., and Frauenfelder, H., "Conformational Substates in a Protein: The Structure of Myoglobin at 80K", **Proc. Nat. Acad. Sci.**, 79, 4967-4971 (1982).
33. E. Pinn, A. Pahler, W. Sanger, Petsko, G.A., and Green, N.M. "Crystallization and Preliminary X-Ray Investigation of Avidin", **Eur. J. Biochem.**, 123, 545-546 (1982).
34. Gilbert, W.A., Lord, R.C., Petsko, G.A., and Thamann, T.J. "Temperature Dependence of the Conformation of Crystalline Ribonuclease A from X-Ray Diffraction and Raman Spectroscopy", **J. Raman Spectroscopy**, 12, 173-179 (1982).
35. Mowbray, S. and Petsko, G.A. "Preliminary X-Ray Data for the Ribose Binding Protein from *Salmonella typhimurium*", **J. Mol. Biol.**, 160, 545-547 (1982).
36. Alber, T., Gilbert, W.A., Ringe Ponzi, D. and Petsko, G.A. "The Role of Mobility in the Substrate Binding and Catalytic Machinery of Enzymes", **CIBA Foundation Symposia**, 93, 4-24 (1982).
37. Gilbert, W.A., Kuriyan, J., Petsko, G.A., and Ringe Ponzi, D. "Mapping the Spatial Distribution of Protein Fluctuations by X-Ray Diffraction", in **Structure and Dynamics: Nucleic Acids and Proteins**, E. Clementi and R.H. Sarma, Eds. Adenine Press, N.Y., pp. 405-420 (1982).
38. Ringe Ponzi, D., Petsko, G.A., Yamakura, F., Ohmori, D., Suzuki, K., Stallings, W.C., Patridge, K.A., Powers, T.B., Fee, J.A., and Ludwig, M.L. "The Three-Dimensional

- Structure of Iron Superoxide Dismutase", in **Oxy Radicals and Their Scavenger Systems**, G. Cohen and R.A. Greenwald, Eds., Elsevier, N.Y., pp. 340-343 (1983).
39. Seaton, B.A., Head, J.F., Lord, R.C., and Petsko, G.A. "Studies of Calmodulin Structure: Laser Raman Spectroscopy of Biomolecules", **Biochemistry**, 22, 973-978 (1983).
  40. Rose, D.R., Seaton, B.A., Petsko, G.A., Novotny, J., Margolies, M.N., Locke, E., and Haber, E. "Crystallization of the Fab Fragment of a Monoclonal Anti-Digoxin Antibody and its complex with Digoxin", **J. Mol. Biol.**, 164, 81-84 (1983).
  41. Mowbray, S.L., and Petsko, G.A. "The Introduction of Specific Sites for Heavy Metal Binding in a Crystalline Protein", **J. Biol. Chem.**, 258, 5634-5637 (1983).
  42. Smith, W.W., Pattridge, K.A., Ludwig, M.L., Petsko, G.A., Tsernoglou, D., Tanaka, M., and Yasunobu, K. "The Structure of Oxidized Flavodoxin from *anacystis Nidulans*", **J. Mol. Biol.**, 165, 737-755 (1983).
  43. Ringe, D., Petsko, G.A., Yamakura, F., and Suzuki, K. "Determination of the Iron Content of Iron Superoxide Dismutase by Anomalous Scattering", **Proc. Roy. Soc. London**, B218, 119-126 (1983).
  44. Ringe, D., Petsko, G.A., Yamakura, F., Suzuki, K., and Ohmori, D. "Structure of Iron Superoxide Dismutase from *Ps. Ovalis* at 2.9 Å Resolution", **Proc. Nat. Acad. Sci.**, 80, 3879-3883 (1983).
  45. Mowbray, S.L. and Petsko, G.A. "The X-Ray Structure of the Periplasmic Galactose Binding Protein from *Salmonella Typhimurium* at 3 Å Resolution", **J. Biol. Chem.**, 258, 7991-7997 (1983).
  46. Petsko, G.A. and Ringe, D. "Fluctuations in Protein Structure from X-Ray Diffraction", **Ann. Rev. Biophys. and Bioeng.**, 13, 331-371 (1984).
  47. Davenport, R.C., Frankel, D., Petsko, G.A., and Raj Bhandary, U.L. "Site Specific Mutagenesis of Yeast Triose Phosphate Isomerase", **Biochem. Soc. Transactions**, 12, 229-232 (1984).
  48. Ringe, D., Petsko, G.A., Kerr, D.E., and Ortiz de Montellano, P.R. "Reaction of Myoglobin with Phenylhydrazine: A Molecular Doorstop", **Biochemistry**, 23, 2-4 (1984).
  49. Douzou, P. and Petsko, G.A. "Proteins at Work: 'Stop-Action' Pictures at Sub-Zero Temperatures", **Advances in Protein Chemistry**, 36, 245-361 (1984).
  50. Stallings, W.C., Bull, C., Pattridge, K.A., Powers, T.B., Fee, J.A., Ludwig, M.L., Ringe, D., and Petsko, G.A. "The Three-Dimensional Structure of Iron Superoxide-Dismutase: Kinetic and Structural Comparisons with Cu/Zn and Mn Dismutase", in **Oxygen Radicals in Chemistry and Biology**, W. Bors, M. Saran and D. Tait, eds., W. de Gruyter & Co., New York (1984).
  51. Ringe, D., Kuriyan, J., Petsko, G.A., Karplus, M., Frauenfelder, H., Tilton, R.F. Jr., and Kuntz, I.D. Jr., "The Temperature Dependence of Protein Structure and Mobility", **Transactions Am. Cryst. Assoc.**, 20, 109-122 (1984).

52. Seaton, B.A., Campbell, R.L., Petsko, G.A., Rose, D.R., Edelstein, I., and Marcus, F. "Preliminary X-Ray Crystallographic Studies of Pig Kidney Fructose-1,6-bisphosphatase", **J. Biol. Chem.**, 259, 8915-8916 (1984).
53. Tilton, R.F., Kuntz, I.D. Jr., and Petsko, G.A. "Cavities in Proteins: Structure of Metmyoglobin-Xe Complex Solved to 1.9 Å", **Biochemistry**, 12, 2849-2857 (1985).
54. Ringe, D. and Petsko, G.A. "Mapping Protein Dynamics by X-Ray Diffraction", **Progress in Biophysics and Molecular Biology**, 45, 197-235 (1985).
55. Lord, R.C., Petsko, G.A., Seaton, B.A., and Goodfriend, L. "Laser Raman Spectroscopy of Biomolecules: Structural Studies of Ragweed Allergen Ra5", **Spectrochimica Acta**, 41A, 199-203 (1985).
56. Kozelka, J., Petsko, G.A., Lippard, S.J., and Quigley, G.J. "Molecular Mechanics Calculations on cis-[Pt(NH<sub>3</sub>)<sub>2</sub><d(GpG)>] Adducts in Two Oligonucleotide Duplexes", **J. Am. Chem. Soc.**, 107, 4079-4081 (1985).
57. Burley, S.K. and Petsko, G.A. "Aromatic-Aromatic Interaction: A Mechanism of Protein Structure Stabilization", **Science**, 229, 23-28 (1985).
58. Petsko, G.A. "Flow Cell Construction and Use", **Methods in Enzymology**, 114, 141-146 (1985).
59. Petsko, G.A., Kuriyan, J., Gilbert, W.A., Ringe, D., and Karplus, M. "Crystallographic Studies of Enzyme-Substrate Complexes (and Other Things) at Low Temperature", in **Structural Biological Applications of X-Ray Absorption**, H. Bartunik and B. Chance, eds., Academic Press, New York (1985).
60. Kuriyan, J., Levy, R.M., Petsko, G.A., and Karplus, M. "The Effect of Anisotropy and Anharmonicity on Protein Crystallographic Refinement: An Evaluation by Molecular Dynamics", **J. Mol. Biol.**, 190, 227-254 (1986).
61. Kozelka, J., Petsko, G.A., Quigley, G.J., and Lippard, S.J. "High-Salt and Low-Salt Models for Kinked Adducts of cis-Diamminedichloroplatinum(II) with Oligonucleotide Duplexes", **Inorg. Chem.**, 25, 1075-1077 (1986).
62. Burley, S.K., and Petsko, G.A. "Dimerization Energetics of Benzene and Aromatic Amino Acid Side-Chains", **J. Am. Chem. Soc.**, 108, 7995-8001 (1986).
63. Burley, S.K., and Petsko, G.A. "Amino-Aromatic Interactions in Proteins", **FEBS Letters**, 203, 139-143 (1986).
64. Kuriyan, J., Wilz, S., Karplus, M., and Petsko, G.A. "The X-Ray Structure and Refinement of CO-Myoglobin at 1.5 Å Resolution", **J. Mol. Biol.**, 192, 133-154 (1986).
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